SEQUENCE LISTING

<110> Bristol-Myers Squibb Company

<120> NUCLEIC ACID MOLECULES AND POLYPEPTIDES FOR A HUMAN CATION CHANNEL POLYPEPTIDE

<130> D0187NP

<150> US 60/257,865
<151> 2000-12-21

<160> 24

<170> PatentIn version 3.0

<210> 1
<211> 2186
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (20)..(2011)

<220>
<221> misc_feature
<222> (2150)..(2150)
<223> wherein "n" equals A, C, G, or T.

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ctctagatgt acatggagg atg acc gaa aaa acc aat ggt gtg aag agc tcc   52
                     Met Thr Glu Lys Thr Asn Gly Val Lys Ser Ser
                      1   5   10

cca gcc aat aat cac aac cat cat gca cct cct gcc atc aag gcc aat   100
Pro Ala Asn Asn His Asn His His Ala Pro Pro Ala Ile Lys Ala Asn
             15   20   25

ggc aaa gat gac cac agg aca agc agc agg cca cac tct gca gct gac   148
Gly Lys Asp Asp His Arg Thr Ser Ser Arg Pro His Ser Ala Ala Asp
         30   35   40

gat gac acc tcc tca gaa ctg cag agg ctg gca gac gtg gat gcc cca   196
Asp Asp Thr Ser Ser Glu Leu Gln Arg Leu Ala Asp Val Asp Ala Pro
     45   50   55

cag cag gga agg agt ggc ttc cgc agg ata gtt cgc ctg gtg ggg atc   244
Gln Gln Gly Arg Ser Gly Phe Arg Arg Ile Val Arg Leu Val Gly Ile
60   65   70   75

atc aga gaa tgg gcc aac aag aat ttc cga gag gag gaa cct agg cct   292
Ile Arg Glu Trp Ala Asn Lys Asn Phe Arg Glu Glu Glu Pro Arg Pro
                 80   85   90

gac tca ttc ctc gag cgt ttt cgt ggg cct gaa ctc cag act gtg acc   340
Asp Ser Phe Leu Glu Arg Phe Arg Gly Pro Glu Leu Gln Thr Val Thr
             95   100   105

aca cag gag ggg gat ggc aaa ggc gac aag gat ggc gag gac aaa ggc   388

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      Thr Gln Glu Gly Asp Gly Lys Gly Asp Lys Asp Gly Glu Asp Lys Gly
              110                 115                 120

      acc aag aag aaa ttt gaa cta ttt gtc ttg gac cca gct ggg gat ttg      436
      Thr Lys Lys Lys Phe Glu Leu Phe Val Leu Asp Pro Ala Gly Asp Leu
          125                 130                 135

      tac tac tgc tgg cta ttt gtc att gcc atg ccc gtc ctt tac aac tgg      484
      Tyr Tyr Cys Trp Leu Phe Val Ile Ala Met Pro Val Leu Tyr Asn Trp
      140                 145                 150                 155

      tgc ctg ctg gtg gcc aga gcc tgc ttc agt gac cta cag aaa ggc tac      532
      Cys Leu Leu Val Ala Arg Ala Cys Phe Ser Asp Leu Gln Lys Gly Tyr
                          160                 165                 170

      tac ctg gtg tgg ctg gtg ctg gat tat gtc tca gat gtg gtc tac att      580
      Tyr Leu Val Trp Leu Val Leu Asp Tyr Val Ser Asp Val Val Tyr Ile
                      175                 180                 185

      gcg gac ctc ttc atc cga ttg cgc aca ggt ttc ctg gag cag ggg ctg      628
      Ala Asp Leu Phe Ile Arg Leu Arg Thr Gly Phe Leu Glu Gln Gly Leu
              190                 195                 200

      ctg gtc aaa gat acc aag aaa ctg cga gac aac tac atc cac acc ctg      676
      Leu Val Lys Asp Thr Lys Lys Leu Arg Asp Asn Tyr Ile His Thr Leu
          205                 210                 215

      cag ttc aag ctg gat gtg gct tcc atc atc ccc act gac ctg atc tat      724
      Gln Phe Lys Leu Asp Val Ala Ser Ile Ile Pro Thr Asp Leu Ile Tyr
      220                 225                 230                 235

      ttt gct gtg gac atc cac agc cct gag gtg cgc ttc aac cgc ctg ctg      772
      Phe Ala Val Asp Ile His Ser Pro Glu Val Arg Phe Asn Arg Leu Leu
                          240                 245                 250

      cac ttt gcc cgc atg ttt gag ttc ttc gac cgg aca gag aca cgc acc      820
      His Phe Ala Arg Met Phe Glu Phe Phe Asp Arg Thr Glu Thr Arg Thr
                      255                 260                 265

      aac tac cct aac atc ttc cgc atc agc aac ctt gtc ctc tac atc ttg      868
      Asn Tyr Pro Asn Ile Phe Arg Ile Ser Asn Leu Val Leu Tyr Ile Leu
              270                 275                 280

      gtc atc atc cac tgg aat gcc tgc atc tat tat gcc atc tcc aaa tcc      916
      Val Ile Ile His Trp Asn Ala Cys Ile Tyr Tyr Ala Ile Ser Lys Ser
          285                 290                 295

      ata ggc ttt ggg gtc gac acc tgg gtt tac cca aac atc act gac cct      964
      Ile Gly Phe Gly Val Asp Thr Trp Val Tyr Pro Asn Ile Thr Asp Pro
      300                 305                 310                 315

      gag tat ggc tac ctg gct agg gaa tac atc tat tgc ctt tac tgg tcc     1012
      Glu Tyr Gly Tyr Leu Ala Arg Glu Tyr Ile Tyr Cys Leu Tyr Trp Ser
                          320                 325                 330

      aca ctg act ctc act acc att ggg gag aca cca ccc cct gta aag gat     1060
      Thr Leu Thr Leu Thr Thr Ile Gly Glu Thr Pro Pro Pro Val Lys Asp
                      335                 340                 345

      gag gag tac cta ttt gtc atc ttt gac ttc ctg att ggc gtc ctc atc     1108
      Glu Glu Tyr Leu Phe Val Ile Phe Asp Phe Leu Ile Gly Val Leu Ile
```

2

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ttt gcc acc atc gtg gga aat gtg ggc tcc atg atc tcc aac atg aat    1156
Phe Ala Thr Ile Val Gly Asn Val Gly Ser Met Ile Ser Asn Met Asn
    365                 370                 375

gcc acc cgg gca gag ttc cag gct aag atc gat gcc gtg aaa cac tac    1204
Ala Thr Arg Ala Glu Phe Gln Ala Lys Ile Asp Ala Val Lys His Tyr
380                 385                 390                 395

atg cag ttc cga aag gtc agc aag ggg atg gaa gcc aag gtc att agg    1252
Met Gln Phe Arg Lys Val Ser Lys Gly Met Glu Ala Lys Val Ile Arg
                400                 405                 410

tgg ttt gac tac ttg tgg acc aat aag aag aca gtg gat gag cga gaa    1300
Trp Phe Asp Tyr Leu Trp Thr Asn Lys Lys Thr Val Asp Glu Arg Glu
            415                 420                 425

att ctc aag aat ctg cca gcc aag ctc agg gct gag ata gcc acc aat    1348
Ile Leu Lys Asn Leu Pro Ala Lys Leu Arg Ala Glu Ile Ala Thr Asn
        430                 435                 440

gtc cac ttg tcc aca ctc aag aaa gtg cgc atc cat gat tgt gag    1396
Val His Leu Ser Thr Leu Lys Lys Val Arg Ile Phe His Asp Cys Glu
    445                 450                 455

gct ggc ctg ctg gta gag ctg gta ctg aaa ctc cgt cct cag gtc ttc    1444
Ala Gly Leu Leu Val Glu Leu Val Leu Lys Leu Arg Pro Gln Val Phe
460                 465                 470                 475

agt cct ggg gat tac att tgc cgc aaa ggg gac atc ggc aag gag atg    1492
Ser Pro Gly Asp Tyr Ile Cys Arg Lys Gly Asp Ile Gly Lys Glu Met
                480                 485                 490

tac atc att aag gag ggc aaa ctg gca gtg gtg gct gat gat ggt gtg    1540
Tyr Ile Ile Lys Glu Gly Lys Leu Ala Val Val Ala Asp Asp Gly Val
                495                 500                 505

act cag tat gct ctg ctg tcg gct gga agc tgc ttt ggc gag atc agt    1588
Thr Gln Tyr Ala Leu Leu Ser Ala Gly Ser Cys Phe Gly Glu Ile Ser
        510                 515                 520

atc ctt aac att aag ggc agt aaa atg ggc aat cga cgc aca gct aat    1636
Ile Leu Asn Ile Lys Gly Ser Lys Met Gly Asn Arg Arg Thr Ala Asn
    525                 530                 535

atc cgc agc ctg ggc tac tca gat ctc ttc tgc ttg tcc aag gat gat    1684
Ile Arg Ser Leu Gly Tyr Ser Asp Leu Phe Cys Leu Ser Lys Asp Asp
540                 545                 550                 555

ctt atg gaa gct gtg act gag tac cct gat gcc aag aaa gtc cta gaa    1732
Leu Met Glu Ala Val Thr Glu Tyr Pro Asp Ala Lys Lys Val Leu Glu
                560                 565                 570

gag agg ggt cgg gag atc ctc atg aag gag gga ctg ctg gat gag aac    1780
Glu Arg Gly Arg Glu Ile Leu Met Lys Glu Gly Leu Leu Asp Glu Asn
                575                 580                 585

gaa gtg gca acc agc atg gag gtc gac gtg cag gag aag cta ggg cag    1828
Glu Val Ala Thr Ser Met Glu Val Asp Val Gln Glu Lys Leu Gly Gln
        590                 595                 600
```

```
ctg gag acc aac atg gaa acc ttg tac act cgc ttt ggc cgc ctg ctg      1876
Leu Glu Thr Asn Met Glu Thr Leu Tyr Thr Arg Phe Gly Arg Leu Leu
    605             610             615

gct gag tac acg ggg gcc cag cag aag ctc aag cag cgc atc aca gtt      1924
Ala Glu Tyr Thr Gly Ala Gln Gln Lys Leu Lys Gln Arg Ile Thr Val
620             625             630             635

ctg gaa acc aag atg aaa cag aac aat gaa gat gac tac ctg tct gat      1972
Leu Glu Thr Lys Met Lys Gln Asn Asn Glu Asp Asp Tyr Leu Ser Asp
            640             645             650

ggg atg aac agc cct gag ctg gct gct gct gac gag cca taagacctgg      2021
Gly Met Asn Ser Pro Glu Leu Ala Ala Ala Asp Glu Pro
            655             660

ggcccaactg cctctccagc attggccttg gccttgatcc cagaagctag aggagctatt   2081

tagatctccg gatttacatg cattaccctc atgttccctg aattctccca aaagtctctc   2141

tgaccctgng tttttggcct aaacatccaa gattccgcct cggat                  2186


<210>   2
<211>   664
<212>   PRT
<213>   Homo sapiens

<220>
<221>   misc_feature
<222>   (2150)..(2150)
<223>   wherein "n" equals A, C, G, or T.

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Met Thr Glu Lys Thr Asn Gly Val Lys Ser Ser Pro Ala Asn Asn His
1               5                   10                  15


Asn His His Ala Pro Pro Ala Ile Lys Ala Asn Gly Lys Asp Asp His
            20                  25                  30


Arg Thr Ser Ser Arg Pro His Ser Ala Ala Asp Asp Asp Thr Ser Ser
        35                  40                  45


Glu Leu Gln Arg Leu Ala Asp Val Asp Ala Pro Gln Gln Gly Arg Ser
    50                  55                  60


Gly Phe Arg Arg Ile Val Arg Leu Val Gly Ile Ile Arg Glu Trp Ala
65                  70                  75                  80


Asn Lys Asn Phe Arg Glu Glu Glu Pro Arg Pro Asp Ser Phe Leu Glu
                85                  90                  95


Arg Phe Arg Gly Pro Glu Leu Gln Thr Val Thr Thr Gln Glu Gly Asp
```

4

```
Gly Lys Gly Asp Lys Asp Gly Glu Asp Lys Gly Thr Lys Lys Lys Phe
    115                 120                 125

Glu Leu Phe Val Leu Asp Pro Ala Gly Asp Leu Tyr Tyr Cys Trp Leu
    130                 135                 140

Phe Val Ile Ala Met Pro Val Leu Tyr Asn Trp Cys Leu Leu Val Ala
145                 150                 155                 160

Arg Ala Cys Phe Ser Asp Leu Gln Lys Gly Tyr Tyr Leu Val Trp Leu
                165                 170                 175

Val Leu Asp Tyr Val Ser Asp Val Val Tyr Ile Ala Asp Leu Phe Ile
                180                 185                 190

Arg Leu Arg Thr Gly Phe Leu Glu Gln Gly Leu Leu Val Lys Asp Thr
                195                 200                 205

Lys Lys Leu Arg Asp Asn Tyr Ile His Thr Leu Gln Phe Lys Leu Asp
    210                 215                 220

Val Ala Ser Ile Ile Pro Thr Asp Leu Ile Tyr Phe Ala Val Asp Ile
225                 230                 235                 240

His Ser Pro Glu Val Arg Phe Asn Arg Leu Leu His Phe Ala Arg Met
                245                 250                 255

Phe Glu Phe Phe Asp Arg Thr Glu Thr Arg Thr Asn Tyr Pro Asn Ile
                260                 265                 270

Phe Arg Ile Ser Asn Leu Val Leu Tyr Ile Leu Val Ile Ile His Trp
        275                 280                 285

Asn Ala Cys Ile Tyr Tyr Ala Ile Ser Lys Ser Ile Gly Phe Gly Val
    290                 295                 300

Asp Thr Trp Val Tyr Pro Asn Ile Thr Asp Pro Glu Tyr Gly Tyr Leu
305                 310                 315                 320

Ala Arg Glu Tyr Ile Tyr Cys Leu Tyr Trp Ser Thr Leu Thr Leu Thr
                325                 330                 335

Thr Ile Gly Glu Thr Pro Pro Pro Val Lys Asp Glu Glu Tyr Leu Phe
            340                 345                 350
```

```
Val Ile Phe Asp Phe Leu Ile Gly Val Leu Ile Phe Ala Thr Ile Val
        355             360             365

Gly Asn Val Gly Ser Met Ile Ser Asn Met Asn Ala Thr Arg Ala Glu
        370             375             380

Phe Gln Ala Lys Ile Asp Ala Val Lys His Tyr Met Gln Phe Arg Lys
385             390             395             400

Val Ser Lys Gly Met Glu Ala Lys Val Ile Arg Trp Phe Asp Tyr Leu
            405             410             415

Trp Thr Asn Lys Lys Thr Val Asp Glu Arg Glu Ile Leu Lys Asn Leu
        420             425             430

Pro Ala Lys Leu Arg Ala Glu Ile Ala Thr Asn Val His Leu Ser Thr
        435             440             445

Leu Lys Lys Val Arg Ile Phe His Asp Cys Glu Ala Gly Leu Leu Val
        450             455             460

Glu Leu Val Leu Lys Leu Arg Pro Gln Val Phe Ser Pro Gly Asp Tyr
465             470             475             480

Ile Cys Arg Lys Gly Asp Ile Gly Lys Glu Met Tyr Ile Ile Lys Glu
            485             490             495

Gly Lys Leu Ala Val Val Ala Asp Asp Gly Val Thr Gln Tyr Ala Leu
        500             505             510

Leu Ser Ala Gly Ser Cys Phe Gly Glu Ile Ser Ile Leu Asn Ile Lys
        515             520             525

Gly Ser Lys Met Gly Asn Arg Arg Thr Ala Asn Ile Arg Ser Leu Gly
        530             535             540

Tyr Ser Asp Leu Phe Cys Leu Ser Lys Asp Asp Leu Met Glu Ala Val
545             550             555             560

Thr Glu Tyr Pro Asp Ala Lys Lys Val Leu Glu Glu Arg Gly Arg Glu
            565             570             575

Ile Leu Met Lys Glu Gly Leu Leu Asp Glu Asn Glu Val Ala Thr Ser
        580             585             590
```

```
Met Glu Val Asp Val Gln Glu Lys Leu Gly Gln Leu Glu Thr Asn Met
         595                 600                 605

Glu Thr Leu Tyr Thr Arg Phe Gly Arg Leu Leu Ala Glu Tyr Thr Gly
     610                 615                 620

Ala Gln Gln Lys Leu Lys Gln Arg Ile Thr Val Leu Glu Thr Lys Met
625                 630                 635                 640

Lys Gln Asn Asn Glu Asp Asp Tyr Leu Ser Asp Gly Met Asn Ser Pro
                 645                 650                 655

Glu Leu Ala Ala Ala Asp Glu Pro
             660
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<210> 3
<211> 30
<212> DNA
<213> artificial

<220>
<223> Primer

<400> 3
gctctagatg tacatggagg atgaccgaaa   30

<210> 4
<211> 22
<212> DNA
<213> artificial

<220>
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<400> 4
cagccaacgc agtctgtact ct   22

<210> 5
<211> 29
<212> DNA
<213> artificial

<220>
<223> Primer

<400> 5
cgggatccga ggcggaatct tggatgtttt   29

<210> 6
<211> 17
<212> DNA
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<220>
<223> Primer

<400> 6
agagcctgct tcagtga   17

<210> 7
<211> 17
<212> DNA
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<220>
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<400> 7
tcactgaagc aggctct   17

<210> 8
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<212> DNA
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<220>
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<400> 8
ttactggtcc acactga   17

<210> 9
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<220>
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<400> 9
tcagtgtgga ccagtaa   17

<210> 10
<211> 20
<212> DNA
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<220>
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<400> 10
acgcacagct aatatccgca   20

<210> 11
<211> 20
<212> DNA
<213> artificial

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<220>
<223>  Primer

<400>  11
tgcggatatt agctgtgcgt                                               20


<210>  12
<211>  21
<212>  DNA
<213>  artificial

<220>
<223>  Primer

<400>  12
tcagagaatg ggccaacaag a                                             21


<210>  13
<211>  20
<212>  DNA
<213>  artificial

<220>
<223>  Primer

<400>  13
cgaaaacgct cgaggaatga                                               20


<210>  14
<211>  26
<212>  DNA
<213>  artificial

<220>
<223>  Primer/Probe

<400>  14
caggcctagg ttcctcctct cggaaa                                        26


<210>  15
<211>  732
<212>  PRT
<213>  Oryctolagus cuniculus

<400>  15

Met Ser Ser Trp Arg Ser Cys Ala Arg Ala Pro Leu Ser Gly Ser Ala
1               5                   10                  15

Trp Arg Arg Ser Ala Ala Thr Arg Arg Ser Arg Arg Cys Leu Lys Thr
                20                  25                  30

Lys Arg Lys Arg Trp Ser Ser Gly Lys Gly Thr Pro Met Gln Ser Thr
            35                  40                  45

Gln Cys Glu Thr Arg Arg Arg Ala Gln Thr Pro Cys Glu Ser Thr Gly
        50                  55                  60
```

9

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His Thr Trp Arg Met Thr Glu Lys Ser Asn Gly Val Lys Ser Ser Pro
65                  70                  75                      80

Ala Asn Asn His Asn Asn His Val Pro Ala Thr Ile Lys Ala Asn Gly
                85                  90                  95

Lys Asp Glu Ser Arg Thr Arg Ser Arg Pro Gln Ser Ala Ala Asp Asp
                100                 105                 110

Asp Thr Ser Ser Glu Leu Gln Arg Leu Ala Glu Met Asp Ala Pro Gln
        115                 120                 125

Gln Arg Arg Gly Gly Phe Arg Arg Ile Val Arg Val Gly Val Ile
    130                 135                 140

Arg Gln Trp Ala Asn Arg Asn Phe Arg Glu Glu Glu Ala Arg Pro Asp
145                 150                 155                     160

Ser Phe Leu Glu Arg Phe Arg Gly Pro Glu Leu Gln Thr Val Thr Thr
                165                 170                 175

Gln Gln Gly Asp Gly Lys Gly Asp Lys Asp Gly Asp Gly Lys Gly Thr
                180                 185                 190

Lys Lys Lys Phe Glu Leu Phe Val Leu Asp Pro Ala Gly Asp Trp Tyr
        195                 200                 205

Tyr Arg Trp Leu Phe Val Ile Ala Met Pro Val Leu Tyr Asn Trp Cys
    210                 215                 220

Leu Leu Val Ala Arg Ala Cys Phe Ser Asp Leu Gln Arg Gly Tyr Phe
225                 230                 235                     240

Leu Val Trp Leu Val Leu Asp Tyr Phe Ser Asp Val Val Tyr Ile Ala
                245                 250                 255

Asp Leu Phe Ile Arg Leu Arg Thr Gly Phe Leu Glu Gln Gly Leu Leu
        260                 265                 270

Val Lys Asp Pro Lys Lys Leu Arg Asp Asn Tyr Ile His Thr Leu Gln
        275                 280                 285

Phe Lys Leu Asp Val Ala Ser Ile Ile Pro Thr Asp Leu Ile Tyr Phe
    290                 295                 300

Ala Val Gly Ile His Asn Pro Glu Leu Arg Phe Asn Arg Leu Leu His
305                 310                 315                     320

Phe Ala Arg Met Phe Glu Phe Phe Asp Arg Thr Glu Thr Arg Thr Ser
                325                 330                 335

Tyr Pro Asn Ile Phe Arg Ile Ser Asn Leu Val Leu Tyr Ile Leu Val
            340                 345                 350

Ile Ile His Trp Asn Ala Cys Ile Tyr Tyr Ala Ile Ser Lys Ser Ile
        355                 360                 365

Gly Phe Gly Val Asp Thr Trp Val Tyr Pro Asn Ile Thr Asp Pro Glu
    370                 375                 380
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```
Tyr Gly Tyr Leu Ala Arg Glu Tyr Ile Tyr Cys Leu Tyr Trp Ser Thr
385                 390                 395                 400

Leu Thr Leu Thr Thr Ile Gly Glu Thr Pro Pro Val Lys Asp Glu
            405                 410                 415

Glu Tyr Leu Phe Val Ile Phe Asp Phe Leu Ile Gly Val Leu Ile Phe
        420                 425                 430

Ala Thr Ile Val Gly Asn Val Gly Ser Met Ile Ser Asn Met Asn Ala
        435                 440                 445

Thr Arg Ala Glu Phe Gln Ala Lys Ile Asp Ala Val Lys His Tyr Met
    450                 455                 460

Gln Phe Arg Lys Val Ser Lys Glu Met Glu Ala Lys Val Ile Lys Trp
465                 470                 475                 480

Phe Asp Tyr Leu Trp Thr Asn Lys Lys Thr Val Asp Glu Arg Glu Val
            485                 490                 495

Leu Lys Asn Leu Pro Ala Lys Leu Arg Ala Glu Ile Ala Ile Asn Val
            500                 505                 510

His Leu Ser Thr Leu Lys Lys Val Arg Ile Phe Gln Asp Cys Glu Ala
        515                 520                 525

Gly Leu Leu Val Glu Leu Val Leu Lys Leu Arg Pro Gln Val Phe Ser
    530                 535                 540

Pro Gly Asp Tyr Ile Cys Arg Lys Gly Asp Ile Gly Lys Glu Met Tyr
545                 550                 555                 560

Ile Ile Lys Glu Gly Lys Leu Ala Val Val Ala Asp Asp Gly Val Thr
            565                 570                 575

Gln Tyr Ala Leu Leu Ser Ala Gly Ser Cys Phe Gly Glu Ile Ser Ile
        580                 585                 590

Leu Asn Ile Lys Gly Ser Lys Met Gly Asn Arg Arg Thr Ala Asn Ile
        595                 600                 605

Arg Ser Leu Gly Tyr Ser Asp Leu Phe Cys Leu Ser Lys Asp Asp Leu
    610                 615                 620

Met Glu Ala Val Thr Glu Tyr Pro Asp Ala Lys Lys Val Leu Glu Glu
625                 630                 635                 640

Arg Gly Arg Glu Ile Leu Met Lys Glu Gly Leu Leu Asp Glu Asn Glu
                645                 650                 655

Val Ala Ala Ser Met Glu Val Asp Val Gln Glu Lys Leu Lys Gln Leu
        660                 665                 670

Glu Thr Asn Met Glu Thr Leu Tyr Thr Arg Phe Gly Arg Leu Leu Ala
        675                 680                 685

Glu Tyr Thr Gly Ala Gln Gln Lys Leu Lys Gln Arg Ile Thr Val Leu
    690                 695                 700

Glu Val Lys Met Lys Gln Asn Thr Glu Asp Asp Tyr Leu Ser Asp Gly
```

Met Asn Ser Pro Glu Pro Ala Ala Ala Glu Gln Pro
                    725   730

<210> 16
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<212> PRT
<213> Bos taurus

<400> 16

Met Thr Glu Lys Ala Asn Gly Val Lys Ser Ser Pro Ala Asn Asn His
1   5   10   15

Asn His His Ala Pro Pro Ala Ile Lys Ala Ser Gly Lys Asp Asp His
            20   25   30

Arg Ala Ser Ser Arg Pro Gln Ser Ala Ala Ala Asp Asp Thr Ser Ser
        35   40   45

Glu Leu Gln Gln Leu Ala Glu Met Asp Ala Pro Gln Gln Arg Arg Gly
    50   55   60

Gly Phe Arg Arg Ile Ala Arg Leu Val Gly Val Leu Arg Glu Trp Ala
65   70   75   80

Tyr Arg Asn Phe Arg Glu Glu Glu Pro Arg Pro Asp Ser Phe Leu Glu
                85   90   95

Arg Phe Arg Gly Pro Glu Leu His Thr Val Thr Thr Gln Gln Gly Asp
            100   105   110

Gly Lys Gly Asp Lys Asp Gly Glu Gly Lys Gly Thr Lys Lys Lys Phe
        115   120   125

Glu Leu Phe Val Leu Asp Pro Ala Gly Asp Trp Tyr Tyr Arg Trp Leu
    130   135   140

Phe Leu Ile Ala Leu Pro Val Leu Tyr Asn Trp Cys Leu Leu Val Ala
145   150   155   160

Arg Ala Cys Phe Ser Asp Leu Gln Lys Gly Tyr Tyr Ile Val Trp Leu
                165   170   175

Val Leu Asp Tyr Val Ser Asp Val Val Tyr Ile Ala Asp Leu Phe Ile
            180   185   190

Arg Leu Arg Thr Gly Phe Leu Glu Gln Gly Leu Leu Val Lys Asp Thr
        195   200   205

Lys Lys Leu Arg Asp Asn Tyr Ile His Thr Met Gln Phe Lys Leu Asp
    210   215   220

Val Ala Ser Ile Ile Pro Thr Asp Leu Ile Tyr Phe Ala Val Gly Ile
225   230   235   240

His Asn Pro Glu Val Arg Phe Asn Arg Leu Leu His Phe Ala Arg Met
            245   250   255

Phe Glu Phe Phe Asp Arg Thr Glu Thr Arg Thr Ser Tyr Pro Asn Ile

```
              260              265                 270

Phe Arg Ile Ser Asn Leu Ile Leu Tyr Ile Leu Ile Ile Ile His Trp
        275              280              285

Asn Ala Cys Ile Tyr Tyr Ala Ile Ser Lys Ser Ile Gly Phe Gly Val
        290              295              300

Asp Thr Trp Val Tyr Pro Asn Ile Thr Asp Pro Glu Tyr Gly Tyr Leu
305              310              315                        320

Ser Arg Glu Tyr Ile Tyr Cys Leu Tyr Trp Ser Thr Leu Thr Thr
              325              330              335

Thr Ile Gly Glu Thr Pro Pro Val Lys Asp Glu Glu Tyr Leu Phe
              340              345              350

Val Ile Phe Asp Phe Leu Ile Gly Val Leu Ile Phe Ala Thr Ile Val
              355              360              365

Gly Asn Val Gly Ser Met Ile Ser Asn Met Asn Ala Thr Arg Ala Glu
        370              375              380

Phe Gln Ala Lys Ile Asp Ala Val Lys His Tyr Met Gln Phe Arg Lys
385              390              395                        400

Val Ser Lys Glu Met Glu Ala Lys Val Ile Arg Trp Phe Asp Tyr Leu
              405              410              415

Trp Thr Asn Lys Lys Ser Val Asp Glu Arg Glu Val Leu Lys Asn Leu
        420              425              430

Pro Ala Lys Leu Arg Ala Glu Ile Ala Ile Asn Val His Leu Ser Thr
        435              440              445

Leu Lys Lys Val Arg Ile Phe Gln Asp Cys Glu Ala Gly Leu Leu Val
        450              455              460

Glu Leu Val Leu Lys Leu Arg Pro Gln Val Phe Ser Pro Gly Asp Tyr
465              470              475                        480

Ile Cys Arg Lys Gly Asp Ile Gly Lys Glu Met Tyr Ile Ile Lys Glu
              485              490              495

Gly Lys Leu Ala Val Val Ala Asp Asp Gly Val Thr Gln Tyr Ala Leu
        500              505              510

Leu Ser Ala Gly Ser Cys Phe Gly Glu Ile Ser Ile Leu Asn Ile Lys
        515              520              525

Gly Ser Lys Met Gly Asn Arg Arg Thr Ala Asn Ile Arg Ser Leu Gly
        530              535              540

Tyr Ser Asp Leu Phe Cys Leu Ser Lys Asp Asp Leu Met Glu Ala Val
545              550              555                        560

Thr Glu Tyr Pro Asp Ala Lys Arg Val Leu Glu Glu Arg Gly Arg Glu
              565              570              575

Ile Leu Met Lys Glu Gly Leu Leu Asp Glu Asn Glu Val Ala Ala Ser
        580              585              590
```

13

```
Met Glu Val Asp Val Gln Glu Lys Leu Glu Gln Leu Glu Thr Asn Met
        595                 600                 605

Asp Thr Leu Tyr Thr Arg Phe Ala Arg Leu Leu Ala Glu Tyr Thr Gly
    610                 615                 620

Ala Gln Gln Lys Leu Lys Gln Arg Ile Thr Val Leu Glu Thr Lys Met
625                 630                 635                 640

Lys Gln Asn Asn Glu Asp Asp Ser Leu Ser Asp Gly Met Asn Ser Pro
                645                 650                 655

Glu Pro Pro Ala Glu Lys Pro
                660

<210>   17
<211>   664
<212>   PRT
<213>   Mus musculus

<400>   17

Met Met Thr Glu Lys Ser Asn Gly Val Lys Ser Ser Pro Ala Asn Asn
1                   5                   10                  15

His Asn His His Pro Pro Pro Ser Ile Lys Ala Asn Gly Lys Asp Asp
                20                  25                  30

His Arg Ala Gly Ser Arg Pro Gln Ser Val Ala Ala Asp Asp Asp Thr
        35                  40                  45

Ser Ser Glu Leu Gln Arg Leu Ala Glu Met Asp Thr Pro Arg Arg Gly
    50                  55                  60

Arg Gly Gly Phe Arg Arg Ile Val Arg Leu Val Gly Ile Ile Arg Asp
65                  70                  75                  80

Trp Ala Asn Lys Phe Arg Glu Glu Glu Pro Arg Pro Asp Ser Phe
                85                  90                  95

Leu Glu Arg Phe Arg Gly Pro Glu Leu Gln Thr Val Thr Pro His Gln
            100                 105                 110

Gly Asp Gly Lys Gly Asp Lys Asp Gly Glu Gly Lys Gly Thr Lys Lys
        115                 120                 125

Lys Phe Glu Leu Phe Val Leu Asp Pro Ala Gly Asp Trp Tyr Tyr Arg
    130                 135                 140

Trp Leu Phe Val Ile Ala Met Pro Val Leu Tyr Asn Trp Cys Leu Leu
145                 150                 155                 160

Val Ala Arg Ala Cys Phe Ser Asp Leu Gln Arg Asn Tyr Phe Val Val
                165                 170                 175

Trp Leu Val Leu Asp Tyr Phe Ser Asp Thr Val Tyr Ile Ala Asp Leu
            180                 185                 190

Ile Ile Arg Leu Arg Thr Gly Phe Leu Glu Gln Gly Leu Leu Val Lys
        195                 200                 205
```

14

```
Asp Pro Lys Lys Leu Arg Asp Asn Tyr Ile His Thr Leu Gln Phe Lys
    210                 215                 220

Leu Asp Val Ala Ser Ile Ile Pro Thr Asp Leu Ile Tyr Phe Ala Val
225                 230                 235                 240

Gly Ile His Ser Pro Glu Val Arg Phe Asn Arg Leu Leu His Phe Ala
            245                 250                 255

Arg Met Phe Glu Phe Phe Asp Arg Thr Glu Thr Arg Thr Ser Tyr Pro
            260                 265                 270

Asn Ile Phe Arg Ile Ser Asn Val Leu Tyr Ile Leu Val Ile Ile
        275                 280                 285

His Trp Asn Ala Cys Ile Tyr Tyr Ala Ile Ser Lys Ser Ile Gly Phe
    290                 295                 300

Gly Val Asp Thr Trp Val Tyr Pro Asn Ile Thr Asp Pro Glu Tyr Gly
305                 310                 315                 320

Tyr Leu Ala Arg Glu Tyr Ile Tyr Cys Leu Tyr Trp Ser Thr Leu Thr
            325                 330                 335

Leu Thr Thr Ile Gly Glu Thr Pro Pro Pro Val Lys Asp Glu Glu Tyr
            340                 345                 350

Leu Phe Phe Ile Phe Asp Phe Leu Ile Gly Val Leu Ile Phe Ala Thr
        355                 360                 365

Ile Val Gly Asn Val Gly Ser Met Ile Ser Asn Met Asn Ala Thr Arg
    370                 375                 380

Ala Glu Phe Gln Ala Lys Ile Asp Ala Val Lys His Tyr Met Gln Phe
385                 390                 395                 400

Arg Lys Val Ser Lys Asp Met Glu Ala Lys Val Ile Lys Trp Phe Asp
            405                 410                 415

Tyr Leu Trp Thr Asn Lys Lys Thr Val Asp Glu Arg Glu Val Leu Lys
        420                 425                 430

Asn Leu Pro Ala Lys Leu Arg Ala Glu Ile Ala Ile Asn Val His Leu
        435                 440                 445

Ser Thr Leu Lys Lys Val Arg Ile Phe Gln Asp Cys Glu Ala Gly Leu
    450                 455                 460

Leu Val Glu Leu Val Leu Lys Leu Arg Pro Gln Val Phe Ser Pro Gly
465                 470                 475                 480

Asp Tyr Ile Cys Arg Lys Gly Asp Ile Gly Lys Glu Met Tyr Ile Ile
            485                 490                 495

Lys Glu Gly Lys Leu Ala Val Val Ala Asp Asp Gly Val Thr Gln Tyr
        500                 505                 510

Ala Leu Leu Ser Ala Gly Ser Cys Phe Gly Glu Ile Ser Ile Leu Asn
    515                 520                 525
```

```
Ile Lys Gly Ser Lys Met Gly Asn Arg Arg Thr Gly Thr Ile Arg Ser
    530                 535                 540

Leu Gly Tyr Ser Asp Leu Phe Cys Leu Ser Lys Asp Asp Leu Met Glu
545                 550                 555                 560

Ala Val Thr Glu Tyr Pro Asp Ala Lys Lys Val Leu Glu Glu Arg Gly
                565                 570                 575

Arg Glu Ile Leu Met Lys Glu Gly Leu Leu Asp Glu Asn Glu Val Ala
                580                 585                 590

Ala Ser Met Glu Val Asp Val Gln Glu Lys Leu Glu Gln Leu Glu Thr
        595                 600                 605

Asn Met Glu Thr Leu Tyr Thr Arg Phe Ala Arg Leu Leu Ala Glu Tyr
    610                 615                 620

Thr Gly Ala Gln Gln Lys Leu Lys Gln Arg Ile Thr Val Leu Glu Thr
625                 630                 635                 640

Lys Met Lys Gln Asn His Glu Asp Asp Tyr Leu Ser Asp Gly Ile Asn
                645                 650                 655

Thr Pro Glu Pro Ala Val Ala Glu
            660
```

<210> 18
<211> 664
<212> PRT
<213> Rattus norvegicus

<400> 18

```
Met Met Thr Glu Lys Ser Asn Gly Val Lys Ser Ser Pro Ala Asn Asn
1                5                   10                  15

His Asn His His Pro Pro Pro Ser Ile Lys Ala Asn Gly Lys Asp Asp
                20                  25                  30

His Arg Ala Gly Ser Arg Pro Gln Ser Val Ala Ala Asp Asp Asp Thr
        35                  40                  45

Ser Pro Glu Leu Gln Arg Leu Ala Glu Met Asp Thr Pro Arg Arg Gly
    50                  55                  60

Arg Gly Gly Phe Gln Arg Ile Val Arg Leu Val Gly Val Ile Arg Asp
65                  70                  75                  80

Trp Ala Asn Lys Asn Phe Arg Glu Glu Glu Pro Arg Pro Asp Ser Phe
                85                  90                  95

Leu Glu Arg Phe Arg Gly Pro Glu Leu Gln Thr Val Thr Thr His Gln
                100                 105                 110

Gly Asp Asp Lys Gly Gly Lys Asp Gly Glu Gly Lys Gly Thr Lys Lys
        115                 120                 125

Lys Phe Glu Leu Phe Val Leu Asp Pro Ala Gly Asp Trp Tyr Tyr Arg
    130                 135                 140
```

```
Trp Leu Phe Val Ile Ala Met Pro Val Leu Tyr Asn Trp Cys Leu Leu
145                 150                 155                 160

Val Ala Arg Ala Cys Phe Ser Asp Leu Gln Arg Asn Tyr Phe Val Val
                165                 170                 175

Trp Leu Val Leu Asp Tyr Phe Ser Asp Thr Val Tyr Ile Ala Asp Leu
            180                 185                 190

Ile Ile Arg Leu Arg Thr Gly Phe Leu Glu Gln Gly Leu Leu Val Lys
        195                 200                 205

Asp Pro Lys Lys Leu Arg Asp Asn Tyr Ile His Thr Leu Gln Phe Lys
    210                 215                 220

Leu Asp Val Ala Ser Ile Ile Pro Thr Asp Leu Ile Tyr Phe Ala Val
225                 230                 235                 240

Gly Ile His Ser Pro Glu Val Arg Phe Asn Arg Leu Leu His Phe Ala
                245                 250                 255

Arg Met Phe Glu Phe Phe Asp Arg Thr Glu Thr Arg Thr Ser Tyr Pro
            260                 265                 270

Asn Ile Phe Arg Ile Ser Asn Leu Val Leu Tyr Ile Leu Val Ile Ile
        275                 280                 285

His Trp Asn Ala Cys Ile Tyr Tyr Val Ile Ser Lys Ser Ile Gly Phe
    290                 295                 300

Gly Val Asp Thr Trp Val Tyr Pro Asn Ile Thr Asp Pro Glu Tyr Gly
305                 310                 315                 320

Tyr Leu Ala Arg Glu Tyr Ile Tyr Cys Leu Tyr Trp Ser Thr Leu Thr
                325                 330                 335

Leu Thr Thr Ile Gly Glu Thr Pro Pro Pro Val Lys Asp Glu Glu Tyr
            340                 345                 350

Leu Phe Val Ile Phe Asp Phe Leu Ile Gly Val Leu Ile Phe Ala Thr
        355                 360                 365

Ile Val Gly Asn Val Gly Ser Met Ile Ser Asn Met Asn Ala Thr Arg
    370                 375                 380

Ala Glu Phe Gln Ala Lys Ile Asp Ala Val Lys His Tyr Met Gln Phe
385                 390                 395                 400

Arg Lys Val Ser Lys Asp Met Glu Ala Lys Val Ile Lys Trp Phe Asp
                405                 410                 415

Tyr Leu Trp Thr Asn Lys Lys Thr Val Asp Glu Arg Glu Val Leu Lys
            420                 425                 430

Asn Leu Pro Ala Lys Leu Arg Ala Glu Ile Ala Ile Asn Val His Leu
        435                 440                 445

Ser Thr Leu Lys Lys Val Arg Ile Phe Gln Asp Cys Glu Ala Gly Leu
    450                 455                 460

Leu Val Glu Leu Val Leu Lys Leu Arg Pro Gln Val Phe Ser Pro Gly
```

17

```
Asp Tyr Ile Cys Arg Lys Gly Asp Ile Gly Lys Glu Met Tyr Ile Ile
                485                  490                  495

Lys Glu Gly Lys Leu Ala Val Val Ala Asp Asp Gly Val Thr Gln Tyr
            500                  505                  510

Ala Leu Leu Ser Ala Gly Ser Cys Phe Gly Glu Ile Ser Ile Leu Asn
        515                  520                  525

Ile Lys Gly Ser Lys Met Gly Asn Arg Arg Thr Ala Asn Ile Arg Ser
    530                  535                  540

Leu Gly Tyr Ser Asp Leu Phe Cys Leu Ser Lys Asp Asp Leu Met Glu
545                  550                  555                  560

Ala Val Thr Glu Tyr Pro Asp Ala Lys Lys Val Leu Glu Glu Arg Gly
                565                  570                  575

Arg Glu Ile Leu Met Lys Glu Gly Leu Leu Asp Glu Asn Glu Val Ala
            580                  585                  590

Ala Ser Met Glu Val Asp Val Gln Glu Lys Leu Glu Gln Leu Glu Thr
        595                  600                  605

Asn Met Asp Thr Leu Tyr Thr Arg Phe Ala Arg Leu Leu Ala Glu Tyr
    610                  615                  620

Thr Gly Ala Gln Gln Lys Leu Lys Gln Arg Ile Thr Val Leu Glu Thr
625                  630                  635                  640

Lys Met Lys Gln Asn His Glu Asp Asp Tyr Leu Ser Asp Gly Ile Asn
                645                  650                  655

Thr Pro Glu Pro Thr Ala Ala Glu
                660
```

```
<210>   19
<211>   39
<212>   DNA
<213>   Homo sapiens

<400>   19
gcagcagcgg ccgctactac tgctggctat ttgtcattg                          39


<210>   20
<211>   36
<212>   DNA
<213>   Homo sapiens

<400>   20
gcagcagtcg actggctcgt cagcagcagc cagctc                             36


<210>   21
<211>   38
<212>   DNA
<213>   Homo sapiens
```

```
<400>  21
gcagcagcgg ccgcatgacc gaaaaaacca atggtgtg                                38


<210>  22
<211>  36
<212>  DNA
<213>  Homo sapiens

<400>  22
gcagcagtcg acgaagacct gaggacggag tttcag                                  36


<210>  23
<211>  2190
<212>  DNA
<213>  Homo sapiens

<220>
<221>  CDS
<222>  (20)..(2011)

<400>  23
ctctagatgt acatggagg atg acc gaa aaa acc aat ggt gtg aag agc tcc         52
                     Met Thr Glu Lys Thr Asn Gly Val Lys Ser Ser
                      1               5                  10

cca gcc aat aat cac aac cat cat gca cct cct gcc atc aag gcc aat        100
Pro Ala Asn Asn His Asn His His Ala Pro Pro Ala Ile Lys Ala Asn
            15                  20                  25

ggc aaa gat gac cac agg aca agc agg cca cac tct gca gct gac        148
Gly Lys Asp Asp His Arg Thr Ser Ser Arg Pro His Ser Ala Ala Asp
        30                  35                  40

gat gac acc tcc tca gaa ctg cag agg ctg gca gac gtg gat gcc cca        196
Asp Asp Thr Ser Ser Glu Leu Gln Arg Leu Ala Asp Val Asp Ala Pro
    45                  50                  55

cag cag gga agg agt ggc ttc cgc agg ata gtt cgc ctg gtg ggg atc        244
Gln Gln Gly Arg Ser Gly Phe Arg Arg Ile Val Arg Leu Val Gly Ile
60                  65                  70                  75

atc aga gaa tgg gcc aac aag aat ttc cga gag gag gaa cct agg cct        292
Ile Arg Glu Trp Ala Asn Lys Asn Phe Arg Glu Glu Glu Pro Arg Pro
                80                  85                  90

gac tca ttc ctc gag cgt ttt cgt ggg cct gaa ctc cag act gtg acc        340
Asp Ser Phe Leu Glu Arg Phe Arg Gly Pro Glu Leu Gln Thr Val Thr
            95                  100                 105

aca cag gag ggg gat ggc aaa ggc gac aag gat ggc gag gac aaa ggc        388
Thr Gln Glu Gly Asp Gly Lys Gly Asp Lys Asp Gly Glu Asp Lys Gly
            110                 115                 120

acc aag aag aaa ttt gaa cta ttt gtc ttg gac cca gct ggg gat ttg        436
Thr Lys Lys Lys Phe Glu Leu Phe Val Leu Asp Pro Ala Gly Asp Leu
    125                 130                 135

tac tac tgc tgg cta ttt gtc att gcc atg ccc gtc ctt tac aac tgg        484
Tyr Tyr Cys Trp Leu Phe Val Ile Ala Met Pro Val Leu Tyr Asn Trp
```

19

```
tgc ctg ctg gtg gcc aga gcc tgc ttc agt gac cta cag aaa ggc tac    532
Cys Leu Leu Val Ala Arg Ala Cys Phe Ser Asp Leu Gln Lys Gly Tyr
                160                 165                 170

tac ctg gtg tgg ctg gtg ctg gat tat gtc tca gat gtg gtc tac att    580
Tyr Leu Val Trp Leu Val Leu Asp Tyr Val Ser Asp Val Val Tyr Ile
                175                 180                 185

gcg gac ctc ttc atc cga ttg cgc aca ggt ttc ctg gag cag ggg ctg    628
Ala Asp Leu Phe Ile Arg Leu Arg Thr Gly Phe Leu Glu Gln Gly Leu
            190                 195                 200

ctg gtc aaa gat acc aag aaa ctg cga gac aac tac atc cac acc ctg    676
Leu Val Lys Asp Thr Lys Lys Leu Arg Asp Asn Tyr Ile His Thr Leu
        205                 210                 215

cag ttc aag ctg gat gtg gct tcc atc atc ccc act gac ctg atc tat    724
Gln Phe Lys Leu Asp Val Ala Ser Ile Ile Pro Thr Asp Leu Ile Tyr
220                 225                 230                 235

ttt gct gtg gac atc cac agc cct gag gtg cgc ttc aac cgc ctg ctg    772
Phe Ala Val Asp Ile His Ser Pro Glu Val Arg Phe Asn Arg Leu Leu
                240                 245                 250

cac ttt gcc cgc atg ttt gag ttc ttt gac cgg aca gag aca cgc acc    820
His Phe Ala Arg Met Phe Glu Phe Phe Asp Arg Thr Glu Thr Arg Thr
            255                 260                 265

aac tac cct aac atc ttc cgc atc agc aac ctt gtc ctc tac atc ttg    868
Asn Tyr Pro Asn Ile Phe Arg Ile Ser Asn Leu Val Leu Tyr Ile Leu
            270                 275                 280

gtc atc atc cac tgg aat gcc tgc atc tat tat gcc atc tcc aaa tcc    916
Val Ile Ile His Trp Asn Ala Cys Ile Tyr Tyr Ala Ile Ser Lys Ser
        285                 290                 295

ata ggc ttt ggg gtc gac acc tgg gtt tac cca aac atc act gac cct    964
Ile Gly Phe Gly Val Asp Thr Trp Val Tyr Pro Asn Ile Thr Asp Pro
300                 305                 310                 315

gag tat ggc tac ctg gct agg gaa tac atc tat tgc ctt tac tgg tcc    1012
Glu Tyr Gly Tyr Leu Ala Arg Glu Tyr Ile Tyr Cys Leu Tyr Trp Ser
                320                 325                 330

aca ctg act ctc act acc att ggg gag aca cca ccc cct gta aag gat    1060
Thr Leu Thr Leu Thr Thr Ile Gly Glu Thr Pro Pro Pro Val Lys Asp
            335                 340                 345

gag gag tac cta ttt gtc atc ttt gac ttc ctg att ggc gtc ctc atc    1108
Glu Glu Tyr Leu Phe Val Ile Phe Asp Phe Leu Ile Gly Val Leu Ile
            350                 355                 360

ttt gcc acc atc gtg gga aat gtg ggc tcc atg atc tcc aac atg aat    1156
Phe Ala Thr Ile Val Gly Asn Val Gly Ser Met Ile Ser Asn Met Asn
        365                 370                 375

gcc acc cgg gca gag ttc cag gct aag atc gat gcc gtg aaa cac tac    1204
Ala Thr Arg Ala Glu Phe Gln Ala Lys Ile Asp Ala Val Lys His Tyr
380                 385                 390                 395
```

20

```
atg cag ttc cga aag gtc agc aag ggg atg gaa gcc aag gtc att agg    1252
Met Gln Phe Arg Lys Val Ser Lys Gly Met Glu Ala Lys Val Ile Arg
            400                     405                 410

tgg ttt gac tac ttg tgg acc aat aag aag aca gtg gat gag cga gaa    1300
Trp Phe Asp Tyr Leu Trp Thr Asn Lys Lys Thr Val Asp Glu Arg Glu
            415                     420                 425

att ctc aag aat ctg cca gcc aag ctc agg gct gag ata gcc atc aat    1348
Ile Leu Lys Asn Leu Pro Ala Lys Leu Arg Ala Glu Ile Ala Ile Asn
            430                     435                 440

gtc cac ttg tcc aca ctc aag aaa gtg cgc atc ttc cat gat tgt gag    1396
Val His Leu Ser Thr Leu Lys Lys Val Arg Ile Phe His Asp Cys Glu
        445                     450                 455

gct ggc ctg ctg gta gag ctg gta ctg aaa ctc cgt cct cag gtc ttc    1444
Ala Gly Leu Leu Val Glu Leu Val Leu Lys Leu Arg Pro Gln Val Phe
460                     465                 470                 475

agt cct ggg gat tac att tgc cgc aaa ggg gac atc ggc aag gag atg    1492
Ser Pro Gly Asp Tyr Ile Cys Arg Lys Gly Asp Ile Gly Lys Glu Met
                    480                     485                 490

tac atc att aag gag ggc aaa ctg gca gtg gtg gct gat gat ggt gtg    1540
Tyr Ile Ile Lys Glu Gly Lys Leu Ala Val Val Ala Asp Asp Gly Val
                495                     500                 505

act cag tat gct ctg ctg tcg gct gag agc tgc ttt ggc gag atc agt    1588
Thr Gln Tyr Ala Leu Leu Ser Ala Gly Ser Cys Phe Gly Glu Ile Ser
            510                     515                 520

atc ctt aac att aag ggc agt aaa atg ggc aat cga cgc aca gct aat    1636
Ile Leu Asn Ile Lys Gly Ser Lys Met Gly Asn Arg Arg Thr Ala Asn
        525                     530                 535

atc cgc agc ctg ggc tac tca gat ctc ttc tgc ttg tcc aag gat gat    1684
Ile Arg Ser Leu Gly Tyr Ser Asp Leu Phe Cys Leu Ser Lys Asp Asp
540                     545                     550                 555

ctt atg gaa gct gtg act gag tac cct gat gcc aag aaa gtc cta gaa    1732
Leu Met Glu Ala Val Thr Glu Tyr Pro Asp Ala Lys Lys Val Leu Glu
                    560                     565                 570

gag agg ggt cgg gag atc ctc atg aag gag gga ctg ctg gat gag aac    1780
Glu Arg Gly Arg Glu Ile Leu Met Lys Glu Gly Leu Leu Asp Glu Asn
                575                     580                 585

gaa gtg gca acc agc atg gag gtc gac gtg cag gag aag cta ggg cag    1828
Glu Val Ala Thr Ser Met Glu Val Asp Val Gln Glu Lys Leu Gly Gln
            590                     595                 600

ctg gag acc aac atg gaa acc ttg tac act cgc ttt ggc cgc ctg ctg    1876
Leu Glu Thr Asn Met Glu Thr Leu Tyr Thr Arg Phe Gly Arg Leu Leu
        605                     610                 615

gct gag tac acg ggg gcc cag cag aag ctc aag cag cgc atc aca gtt    1924
Ala Glu Tyr Thr Gly Ala Gln Gln Lys Leu Lys Gln Arg Ile Thr Val
620                     625                     630                 635
```

21

```
ctg gaa acc aag atg aaa cag aac aat gaa gat gac tac ctg tct gat      1972
Leu Glu Thr Lys Met Lys Gln Asn Asn Glu Asp Asp Tyr Leu Ser Asp
                640                 645                 650

ggg atg aac agc cct gag ctg gct gct gct gac gag cca taagacctgg       2021
Gly Met Asn Ser Pro Glu Leu Ala Ala Ala Asp Glu Pro
            655                 660

ggcccaactg cctctccagc attggccttg gccttgatcc cagaagctag aggagctatt   2081

tagatctccg gatttacatg cattaccctc atgttccctg aattctccca aaagcctctc   2141

tgaccctggg tttttggcct aaacatccaa gattccgcct cggatcccg               2190
```

```
<210>    24
<211>    664
<212>    PRT
<213>    Homo sapiens

<400>    24

Met Thr Glu Lys Thr Asn Gly Val Lys Ser Ser Pro Ala Asn Asn His
1                5                  10                  15

Asn His His Ala Pro Pro Ala Ile Lys Ala Asn Gly Lys Asp Asp His
                20                 25                  30

Arg Thr Ser Ser Arg Pro His Ser Ala Ala Asp Asp Asp Thr Ser Ser
            35                  40                  45

Glu Leu Gln Arg Leu Ala Asp Val Asp Ala Pro Gln Gln Gly Arg Ser
        50                  55                  60

Gly Phe Arg Arg Ile Val Arg Leu Val Gly Ile Ile Arg Glu Trp Ala
65                  70                  75                  80

Asn Lys Asn Phe Arg Glu Glu Glu Pro Arg Pro Asp Ser Phe Leu Glu
                85                  90                  95

Arg Phe Arg Gly Pro Glu Leu Gln Thr Val Thr Thr Gln Glu Gly Asp
            100                 105                 110

Gly Lys Gly Asp Lys Asp Gly Glu Asp Lys Gly Thr Lys Lys Lys Phe
            115                 120                 125

Glu Leu Phe Val Leu Asp Pro Ala Gly Asp Leu Tyr Tyr Cys Trp Leu
        130                 135                 140

Phe Val Ile Ala Met Pro Val Leu Tyr Asn Trp Cys Leu Leu Val Ala
145                 150                 155                 160
```

22

```
Arg Ala Cys Phe Ser Asp Leu Gln Lys Gly Tyr Tyr Leu Val Trp Leu
            165                 170                 175

Val Leu Asp Tyr Val Ser Asp Val Val Tyr Ile Ala Asp Leu Phe Ile
            180                 185                 190

Arg Leu Arg Thr Gly Phe Leu Glu Gln Gly Leu Leu Val Lys Asp Thr
        195                 200                 205

Lys Lys Leu Arg Asp Asn Tyr Ile His Thr Leu Gln Phe Lys Leu Asp
    210                 215                 220

Val Ala Ser Ile Ile Pro Thr Asp Leu Ile Tyr Phe Ala Val Asp Ile
225                 230                 235                 240

His Ser Pro Glu Val Arg Phe Asn Arg Leu Leu His Phe Ala Arg Met
            245                 250                 255

Phe Glu Phe Phe Asp Arg Thr Glu Thr Arg Thr Asn Tyr Pro Asn Ile
            260                 265                 270

Phe Arg Ile Ser Asn Leu Val Leu Tyr Ile Leu Val Ile Ile His Trp
        275                 280                 285

Asn Ala Cys Ile Tyr Tyr Ala Ile Ser Lys Ser Ile Gly Phe Gly Val
    290                 295                 300

Asp Thr Trp Val Tyr Pro Asn Ile Thr Asp Pro Glu Tyr Gly Tyr Leu
305                 310                 315                 320

Ala Arg Glu Tyr Ile Tyr Cys Leu Tyr Trp Ser Thr Leu Thr Leu Thr
            325                 330                 335

Thr Ile Gly Glu Thr Pro Pro Pro Val Lys Asp Glu Glu Tyr Leu Phe
            340                 345                 350

Val Ile Phe Asp Phe Leu Ile Gly Val Leu Ile Phe Ala Thr Ile Val
        355                 360                 365

Gly Asn Val Gly Ser Met Ile Ser Asn Met Asn Ala Thr Arg Ala Glu
    370                 375                 380

Phe Gln Ala Lys Ile Asp Ala Val Lys His Tyr Met Gln Phe Arg Lys
385                 390                 395                 400
```

23

```
Val Ser Lys Gly Met Glu Ala Lys Val Ile Arg Trp Phe Asp Tyr Leu
            405                     410                 415

Trp Thr Asn Lys Lys Thr Val Asp Glu Arg Glu Ile Leu Lys Asn Leu
            420                 425                 430

Pro Ala Lys Leu Arg Ala Glu Ile Ala Ile Asn Val His Leu Ser Thr
        435                 440                 445

Leu Lys Lys Val Arg Ile Phe His Asp Cys Glu Ala Gly Leu Leu Val
    450                 455                 460

Glu Leu Val Leu Lys Leu Arg Pro Gln Val Phe Ser Pro Gly Asp Tyr
465                 470                 475                 480

Ile Cys Arg Lys Gly Asp Ile Gly Lys Glu Met Tyr Ile Ile Lys Glu
            485                 490                 495

Gly Lys Leu Ala Val Val Ala Asp Asp Gly Val Thr Gln Tyr Ala Leu
        500                 505                 510

Leu Ser Ala Gly Ser Cys Phe Gly Glu Ile Ser Ile Leu Asn Ile Lys
    515                 520                 525

Gly Ser Lys Met Gly Asn Arg Arg Thr Ala Asn Ile Arg Ser Leu Gly
    530                 535                 540

Tyr Ser Asp Leu Phe Cys Leu Ser Lys Asp Asp Leu Met Glu Ala Val
545                 550                 555                 560

Thr Glu Tyr Pro Asp Ala Lys Lys Val Leu Glu Glu Arg Gly Arg Glu
            565                 570                 575

Ile Leu Met Lys Glu Gly Leu Leu Asp Glu Asn Glu Val Ala Thr Ser
            580                 585                 590

Met Glu Val Asp Val Gln Glu Lys Leu Gly Gln Leu Glu Thr Asn Met
        595                 600                 605

Glu Thr Leu Tyr Thr Arg Phe Gly Arg Leu Leu Ala Glu Tyr Thr Gly
    610                 615                 620

Ala Gln Gln Lys Leu Lys Gln Arg Ile Thr Val Leu Glu Thr Lys Met
625                 630                 635                 640

Lys Gln Asn Asn Glu Asp Asp Tyr Leu Ser Asp Gly Met Asn Ser Pro
```

24

Glu Leu Ala Ala Ala Asp Glu Pro
          660